SPECIFICATIONS

FOR

WORK AND MATERIALS REQUIRED FOR THE ERECTION AND FINISHING OF THE "PERMANENT CENTENNIAL BUILDING," ON LANDSDOWNE TERRACE, FAIRMOUNT PARK, IN ACCORDANCE WITH THE ACCOMPANYING PLANS, ELEVATIONS, ETC.

PREPARED BY

H. J. SCHWARZMANN, ARCHITECT

The plans are as follows, to wit:—

No. 1.—General Ground Plan.
No. 2.—Front Elevation.
No. 3.—Rear Elevation.
No. 4.—Side Elevation.
No. 5.—Longitudinal Section.
No. 6.—Transverse Section; and
No. 7.—Section through Picture-Gallery.

The design covers a space of 333⅓ feet front by 192⅔ feet on the flanks, all of which will be devoted to exhibition-rooms, halls, and corridors, except an area of 83⅓ feet by 38 feet on each side of the front entrance.

These spaces will be embellished as parterres, or flower-gardens, in connection with the arcades, which form part of the principal façade.

Terraces will be formed around the whole Building, surmounted by stone balustrades.

Each part of the Building shall be completed in a good and workmanlike manner to the full intent and meaning of these specifications and the drawings, and details hereafter to be furnished in explanation of the drawings, and to the entire satisfaction of the Building Committee, and their Architect, either of whom shall have full power to refuse any materials different from those described as to be used, and to cause any unsound work, or work that is not in strict conformity with the drawings, to be taken down at the Contractor's expense.

Any work or material necessary for the proper construction of the

Building, or deemed by the Architect essential to properly carry out the plans, even though not specially mentioned, but evident from the nature of the case, shall be done or furnished by the Contractor without extra charge for the same.

If any alterations should be made in the drawings, or any change of construction, or difference of material, other than expressed by the plans and specifications, the cost of such changes and alterations shall be determined upon before being made, and be agreed upon in writing by the Architect and Building Committee, otherwise no charge for the same shall be allowed.

In case of disagreement, however, in any case, between the Contractor and Architect, the points of difference shall be submitted, in writing, to two referees, one chosen by each party; and in case of disagreement between the referees, such points as they may fail to agree upon shall be submitted to an umpire, selected by them, whose decision shall be final.

A railroad track to the building-site, connecting with the Pennsylvania Railroad tracks, at Elm Avenue, will be laid by the "Centennial Board of Finance," on which the Contractor shall have the right to transport his materials during the progress of the work, and until the completion thereof; any connections for the greater convenience of the Contractor must be made at his expense, with the consent of the Building Committee and Architect.

Satisfactory security will be required for the performance of the contract, equal to fifteen (15) per cent. on the total sum covered by the contract.

Payments will be made monthly, on the estimates of the Architect, not to include material delivered, and on the total sum of the several estimates ten (10) per cent. will be retained, until the aggregate amount of such retained percentage shall be equal to five (5) per cent. on the total amount of the contract, after which the estimates shall be paid in full; provided the estimates do not exceed the appropriations made by the State and City, which are limited to $75,000 for any one month, and $525,000 in one year.

N. B.—The water supply for building purposes will be furnished by the Contractor.

The Contractor will furnish all material, labor, cartage, and machines necessary for the completion of his contract to the full intent and meaning of these drawings and specifications, either expressed or implied.

The Contractor will be required to remove at his own expense all rubbish which cannot be used in or near the Building.

The Contractor will deliver the ground and Building clean and perfect at the completion of the work.

In their proposals, the bidders will specify the time in which they propose to complete and deliver the Building; said time not to be later than March 1, 1876; and if this specified time should not be complied

with, the contractor will thereby make himself liable to a forfeiture of one dollar ($1) for each thousand dollars of the amount of his contract for each and every day consumed after the specified time.

On the other hand, the Centennial Board of Finance will allow a reward or bonus, calculated on the same basis, for work completed and delivered before the time stipulated.

Contractors will also be held responsible for damage, of whatsoever kind, done to any part of the Building by their subordinates or by neglect of necessary precaution, and will in such cases repair the same at their own expense and without delay.

During the time given for estimating, additional explanations and changes may be made to the specifications, which will be shown in red ink; each bidder will therefore be required to read them over again before handing in his proposal.

Figured dimensions are in all cases to be taken before written dimensions.

Bids must be made on forms furnished, and no others will be received. The Centennial Board of Finance do not bind themselves to accept the lowest, or any bid.

EXCAVATION.

Bids for this work, as far as required for the present, will be made by the yard of 27 cubic feet measurement of the excavation, and to be deposited without extra charge within 500 feet of the Building, as may be directed by the Architect The space occupied by the Building is to be leveled for floor of basement at the level of 114 feet as shown.

Dig trenches for foundation walls, piers, and steps, one (1) foot wider than actual width of footings, and to a depth of feet, or until a firm stratum is reached.

On bank walls there will be no projection for footings on the outside, unless the ground should be so loose as to give no support to walls.

Care must be taken to have the sides of excavation straight and square, and to prevent caving in by shoring, if necessary.

Beds of trenches to be properly leveled and dug in steps, where required by the natural line of strata.

As the stone foundations are built the Contractor will fill earth against them at least for every two (2) feet of height, and ram hard and solid.

Any gravel coming out of the excavation or trenches, if considered fit for building purposes by the Architect, will be carefully screened through a ¼ screen, and deposited in such places near the Building, or in the basement, as directed.

Level floors of halls, and ram to a hard surface. The maximum lengths of hauls not to exceed 500 feet from the Building.

All excavated soil will be used for filling up and forming embank-

ments where directed. Such filling to be done in layers not more than 12″ at a time, the same to be roughly leveled and rammed down.

Dig trenches for drains with a fall of 1 in 30 (average) from rain-conductors and water-closets, and connect the same with sewer laid by the Centennial Board of Finance.

FOUNDATIONS.

Lay a thick bed of mortar under all footings. The footings to all foundation walls to have a projection of not less than 6″ on each side, to be not less than 6″ in thickness, flat bedded, and laid in the direction of their natural beds, with an average surface of 16 square feet to each stone for exterior walls, and 12 square feet to each stone for interior walls, to be bedded in concrete where necessary.

Build all walls to the full thickness shown on the drawings, of 2 and 3 men stone, well bedded in mortar, and the interstices well grouted. The basement walls to be left with the natural rock face, and troweled.

Build all foundations for terrace, steps, and arches as shown, and provide and set all required centering for the latter.

Leave openings as directed for drainage, water, and gas. All walls to be carefully squared and leveled at top.

Hall. The foundations under central columns in Main Hall are to be carried up solid to the main floor line, built of dimension stone, in courses of average thickness, carefully bedded, and lowered with derrick to avoid fracture.

For quality of mortar see Bricklayer's Specification.

GRANITE-WORK.

Walls. The exterior walls to be faced with light-colored granite in ashlar courses, and the architectural ornamentation to be composed of the same materials.

Columns. The columns of the centre Building to be in full relief, and those in front of the arcades to project three-fourths of their diameter.

Plinth. The sub-basement or stylobate to be faced with granite in alternate beds, averaging 8 and 16 inches of rusticated work.

Cornices, etc. All the cornices, pediments, pedestals, cheek-blocks, steps, and the balusters and balustrades, and bracketing of the main cornice, to be of the same material, fine dressed, 8 channels to the inch.

Digitized by the Internet Archive
in 2016

https://archive.org/details/specificationsfo00schw

The alternating courses of the broad piers on pavilions and walls of end elevations indicated by darker tints to consist of the same material, rusticated. Courses.

All arrisses to be drafted 1″ horizontally and vertically, except angles, which will be 2″ wide.

All the arch moulds, shields, imposts niches, perforated and turned balustrades, dentils, and carving are to be dressed in the best manner, 10 cuts to the inch, with thin joints.

Carefully bed all stones, and cramp with zinc cramps run in with lead.

Run all arrisses even and true, and leave the whole of the work clean and perfect at the completion thereof.

Lay the whole of the floor surface of the main floor of the Building and the arcade with Minton & Co.'s mosaic tiles, in best cement on 3″ hard rubble, rammed solid, or of marble tiles in selected tints—on 3″ hard rubble, as before.

Lay the floors over summer gardens, arcades, corridor at back, and private rooms with 1″ rubbed slate in Portland cement on proper thickness of concrete.

BRICKLAYER.

Use the best approved bricks, free from lime and other defects, and of uniform size and color, to be approved of by the Architect.

House the bricks when required, and keep the arrisses sharp and true.

The mortar to be composed of good hot lime and clean, sharp river sand, mixed in the proportions directed by the Architect.

The lime must be fresh burnt, delivered in perfectly sound condition (not slaked on the car), and kept under thorough shelter.

Flemish bond is to be used throughout, and no half-headers will be allowed to be used.

No boxing permitted. In lighter walls, every course must be leveled through; thick walls may be built in steps, but throughout all joints must be well flushed up with mortar.

The whole of the exterior walls, from floor line to plate, to be built with a hollow space 2″ wide.

All walls, piers, and arches to be accurately leveled and plumbed. All reveals to be true.

Carefully turn all relieving and other arches. Assist carpenter to set centering where required, the centering being supplied by the latter.

Build in blocks, brackets, strips, and all necessary linings for doors, jambs, etc.

All exposed brick walls to be finished with a neat, flat cut joint as the work proceeds, and afterwards washed down with pure water. Interior walls to be left with rough joint, to form key for plaster.

Leave chases where required for pipes.

Carefully cover all walls with roofers' felt and boards, to protect the same against rain and frost. Backing up of dressed stone to be done in a careful manner, with thin horizontal joints, bricks well hammered down.

Leave proper toothings, and build in anchors for stone-work where the work is not ready to be carried up with the walls.

Insert hoop iron bond where required.

Carefully execute all beam filling, and corbel out for cornices where shown.

Build the arches of fire-proof floor, and ceilings over arcades, corridor at back, and private rooms, of 2 half brick rings laid in cement, with moulded skewbacks, and fill in the haunches with gravel, and level off with mortar to level of crown. Build relieving arches over all openings —depth of arches as directed, 9″ and 13″ in regular bond, all keyed out with slate.

Build the ventilating, heat, and smoke flues as directed, and strike the joints of the same; furnace flues to be lined with fire-brick in best tempered fire-clay to the height directed.

Leave openings for ventilating grades as shown.

Floors. Lay the basement floor throughout with best quality of asphalt paving on a bed of rough mortar.

All floors to be leveled with 3″ hard rubble, and rammed solid.

CARPENTER AND JOINER.

GENERAL EXPLANATIONS.

In the basement there will be, for the present, no work except such as required for outer doors.

The Carpenter will furnish assistance in men and material for laying out, and will attend to the work of all other mechanics, as required by custom.

Provide also the necessary lumber and labor for a square fence around the whole Building (posts outside), leaving 25 feet clear space at steps, and provide the necessary large and small gates.

Build a temporary building for Superintendent, with rooms for tool-house, time-house, and office; the latter room to have a floor, and supplied with shelves for drawings, plain table, suitable as a drawing-board, also stove to provide sufficient heat.

Also shed for storing and priming frames, etc. Erect also two temporary earth-closets for workmen, each with four holes and urinal-box, one to be kept private. Provide door and strong key for this.

Provide and set in an efficient manner all required boxings for exposed stone-work liable to be injured, such as steps, cheeks, water-tables, corners, jambs, sills, cornices, etc. etc.

Cover all walls remaining exposed for any length of time, or during the winter, to protect against injury by weather, or other causes.

Furnish to the stone-cutters, bricklayers, and other artisans, such general templates and patterns as may be required to bring their respective works correctly together.

Include all hardware that is generally required, and such as may hereafter be specially mentioned.

Provide and set all required ribbed and other centering for all arches and fireproof floors with necessary hangers, strips, boards, etc., so as not to detain the bricklayer, or require the striking of centres before the proper time.

All centres to be of sufficient strength, with the necessary cross-pieces, uprights, braces, etc.

Provide also all lumber required for scaffolding for all mechanics except for the following works: plastering, inside galvanized iron-work, and inside painting, which will be supplied and set by the plasterer.

Provide and set also in their respective positions all required jamb-blocks, strips and grounds for wainscoting, and for galvanized iron finish, etc.

The detailed items of this work are as follows:

Roofs.—All the roofs mentioned, and the gutters, will be covered with white or yellow pine milled sheathing boards, thoroughly seasoned, not over 6″ wide, and to be free from knots, sap, shakes, and other defects.

Prepare for all gutters, with proper fall, and large cesspools, with proper openings for eaves-pipes.

Doors and Door-Frames.—Jambs throughout with strong skeleton frames, neatly cased moulded imposts, and pediments with carved busts, as shown on the drawings.

Doors to be $2\frac{1}{2}$″, with additional veneer $\frac{1}{4}$″ thick, 6 panel, 2^{ce} moulded and square—all of solid walnut, being folding. The doors in main hall in 3 folds, and those in picture-galleries in 2 folds, with 3 pair (each) best patent bronzed rising hinges. The centre folds to have (each) $1\frac{1}{2}$ pair butt hinges, as last described.

Subordinate doors in offices 2″ thick, 6 panel, in every respect as last described, to correspond with the general character of work.

The whole of the basement walls are to be furred out with two 2″ × $\frac{3}{4}$″ strips for plasterer. Plug all walls carefully and sufficiently for the same.

WAINSCOTING, WASHBOARDS, ETC.

Wainscoting, where shown on the drawings, in the picture-galleries and offices, to be of narrow, matched, and bearded boards, of well-seasoned walnut, carefully selected, with moulded capping and plinth, returned with true mitres around all angles and reveals.

Capping and plinth to be stopped against all imposts.

Provide and set $\frac{7}{8}$″ ploughed angle-staffs where required. Include a sum for No. 7 water-closets and 3 urinals in the basement (of approved pattern), with all required service-boxes, seats, risers, and spring-flaps, furnished in the best manner.

Build the partition walls in picture-galleries of 4″ by 3″ framed studding.

HARDWARE.

Besides general hardware, such as nails, screws, etc., the following must be furnished:

Best Berlin bronzed knobs to all doors—large size.

Best Berlin bronzed rising hinges to all doors.

Mortise locks to all doors, of proper sizes.

Brass flush bolts of proper sizes.

All slip pivots, knobs, buttons, and rack fasteners to windows.

The main hall doors will be in three folds, the outside folds swinging out, and the centre one swinging both ways. They require for each door 6 pair of 6″ by 7″ hinges, 6 patent 10″ coil springs, 3 bottom and 3 top bolts—to be patent flush bolts, to be $\frac{3}{4}$ rod and plate with projecting knob. The centre fold of each door with 2 14″ plates with raised letters "Push" on each side.

All other doors in two folds, with 3 pair hinges, 4 patent coil springs, 4 top and bottom bolts, as last described.

Provide also neat and strong hooks on proper plates, secured with expansion screws into stone plates, to hold doors back when entirely open. Also hooks for centre folds only.

All of this work throughout of best quality bronze of approved manufacture.

Brass coils of springs, heavily bronzed.

Hinges to be loose, joint butts, with acorns, steel washers, and square bearing on pin.

Basement doors to have best quality American wire joint butts,

strong rim lock, extra dead lock with night key, 1 bottom and 2 top bolts, bronze outside.

Smaller inside doors in basement, doors to water-closets to be provided with proper butts, bolts, locks, rod-springs, clothes-hooks, knobs, etc., to make the whole complete.

Locks to be of approved make, keys for night-latches of main floor to be alike, those in the basement to differ.

Duplicates of all keys and latches to be made.

PLASTERING.

The plastering work will be finished in three-coat work, in the most workmanlike manner and of the best materials.

Float and set all walls and ceilings in fine sand finish, hard and straight for fresco painting, without streaks, joints, or air-blisters.

The work embraces the whole of the basement, first floor, and dome.

Include all moulded cornices, ribs, brackets, consoles, panels, friezes, busts, and medallions.

Also, all the ornamental wreaths, bosses, diapers, and scroll-work in the coved ceilings and dome, which are to be in relief.

All the work is to be most carefully keyed and left clean and perfect.

The furnishing and labor of putting up the wire for ceiling panels is part of the iron-founder.

The plasterer will furnish and put up such wire as may be required to close the recesses for waste-pipes.

Include throughout all plastered jambs, corner beads, mitres, etc.

The plasterer will provide and erect in proper time the scaffolding throughout, for the purpose of putting up the galvanized iron-work, before he commences operations, and he will leave it for the painter for a reasonable time.

CAST-IRON WORK.

This will embrace the following, viz.:

First Floor.—The columns in main hall are to be free from swells and other irregularities, and to be painted and rubbed down to a smooth surface; the bases of same moulded, and smoothed in the same manner; the capitals to be cast in sections and screwed on.

These columns to be of $1\frac{1}{4}''$ metal.

Rain-Conductors. Provide $6'' \times 5''$ square rain-conductors where required, with all heads, shoes, knees, elbows, and ears complete.

Provide, also, pipes for the smoke flues, with flange sockets carefully connected, and running from basement to top of flue. Allow for expansion.

Air Grates. Provide and set cast-iron ornamental air grates where required.

All the castings are to be free from sand-holes and other defects, and the edges of mouldings and ornaments to be sharp and true.

Windows.—Provide and set the cast-iron frames, as shown on the drawings, with flanges on same, to be built in the brick-work as the work proceeds, the sashes to be double hung.

The heads to be semicircular, with moulded and panelled transoms.

Windows in picture-galleries at angles of Building No. 8 to be in every respect as last described, but to have engaged columns on mullions with carved caps and moulded bases.

Stairways.—Provide and set ornamental spiral stairways 3′ 0″ in the clear to basement, with perforated treads and risers housed into walls and newel posts. First floor to gallery and arcades to be of the same materials, but with straight treads, rises, and landings.

Where iron rests on iron, the beds must be planed true Also, all angles.

The whole of the work to be painted both sides with one coat red lead, ground in linseed oil.

The Contractor will include all labor in setting, fitting, and drilling, etc., and leave the whole of the work complete and perfect to the intention and spirit of the drawings and specifications.

WROUGHT-IRON GIRDERS, BEAMS, ROOFS, ETC.

Girders. Girders of the sizes given for the fire-proof floor of picture-galleries, galleries, halls, arcades, corridors, court-gardens, and students' rooms. All work to be of the best rolled iron, and to be tested before leaving the mills, according to the instructions of the Architect.

Columns. Provide columns in sections with proper flanges, and shoe and head plates, running from basement to plate line of dome, built into piers.

Provide and set on the above girders to carry the angles of dome.

Roofs. Provide and erect the whole of the roofs and dome (except purlins) of wrought-iron (see drawings), with their tie and suspension-rods, braces, plates, and shoes, etc., complete at fifty pounds per foot.

Skylights. Frames for skylights and same suspended of angle iron, and with weather flange, to keep them perfectly air-tight. Prepare and submit

patterns for these skylights, cover panels of ceiling with wire-work—No. 16 wire, ½″ mesh—secure well to bars with copper wire.

Insert in walls iron frames, to hang pictures. Provide and set angle iron frames in first floor for light to basement.

GALVANIZED IRON-WORK.

Above the main stone cornice line (outside) the whole of the gutters of roofs, pediments, pedestals, brackets, hip rolls, and ornamental finish of the picture-gallery, roofs to be of this material. Also, the whole of the outside of dome, including pilasters, panels, parapets, etc.

The balustrade around dome will be of cast-iron. Rest of finishing work, such as pilaster bases and caps, friezes, large and small cover of skylights, girders across ceiling lights, muntins, etc., of same material.

The roof lights will be either of Hayes patent, with galvanized iron channels, supports, etc., or of any other kind of equal quality (which may be approved by the Architect), with the proper provision for ventilation and for condensed water, etc.

The groups of figures on dome and on pedestals on the terrace to be zinc, thickly bronzed.

The groups and ornaments of all kinds to be made strictly to the Architect's designs, and models to be made and submitted for approval before execution.

Inside.—Above main cornice lines, as follows:

The whole of the ceilings of dome to be corrugated iron.

Include all necessary cast- or wrought-iron brackets, bosses, shields, etc., of proper strength, to be well secured to beams, rafters, walls, etc. Form the skeleton work for all internal and external finish, the heaviest parts of this being the curves of dome and gallery ceilings.

Stiffeners of angle shape and of proper sizes must be riveted to backs of panels, styles, coves, and curves of all kinds, to preserve straight lines or surfaces and true curves.

All work showing brittleness by breaking at the bent edges will be rejected.

The whole of the work is to be executed in the best and most workmanlike manner, to be straight, plumb, level, out of wind, in true curves, and with perfect mitres.

Particular care and attention must be paid in the preparation of all patterns for ornamental work, all joints to be carefully soldered and laid with an easy off-floor for water, to avoid lodging and leakage. Any work not complying strictly to these instructions will be rejected.

The thickness of iron will be as follows:

PLUMBING.

Supply water from outside by 4″ cast-iron main under basement floor, to near the centre of Building; terminate with three-way 3″ outlet, take 3″ east and west; 2″ branches to fire-cocks; 1½″ for water-closets in basement; 1″ for cistern; leave also two 1½″ outlets for direct supply to boilers; 1″ lead rising mains for water-closets in first story.

All of the above supplied with stops and waste-cocks for each main branch, as directed. Water-way of same capacity as pipes.

Arrangements of pipes will be shown on the drawings.

FIXTURES.

Basement.—Four fire-plugs, four water-closets, and one washstand for ladies, four water-closets and three urinals for gents, and one wash-stand; one sink for engineer.

First Floor.—Same as above, excepting sink.

No. 2 offices with stationary wash-stand and urinal in each.

Outside.—Four temporary hydrants for use of Building, to be changed afterwards to fire-plugs.

The Water-Closets to be most approved pattern, service cisterns lined with 5 ℔ lead, and lead syphon traps complete.

Wash-Stands with large sunk marble tops, 14″ basins, etc., all complete, with sinks and waste-pipes on floor.

Sink, on a stand of galvanized iron.

All with 1¼″ waste-pipe, cast trap, screw cover, chain, and plug.

Urinals, large size, flat back, Bedfordshire supply, with plug and key, polished North River floor, sunk deeply; 1¼″ waste-pipe, brass strainers, trap, etc.

Hydrants with screw nozzle, set in brick, iron cover.

Fire-plugs with 2″ valve-cocks, with wheel, and male and female screw.

Furniture, of real bronze metal, large and heavy, of approved pattern and make.

DRAINAGE.

Cast-iron pipes for perpendicular, and best vitrified terra cotta for horizontal underground.

Arrangement and size of pipes as marked on the basement plan. The 15″ to commence at outside of terrace.

The iron pipes to extend up to top of stone-work. Provide all required bends, Y and T branches, junctions, etc.

Running traps where directed, made accessible. Joints in iron pipe thoroughly caulked and leaded, terra cotta well cemented and carefully swabbed.

The work and material throughout must be of the best quality, and all supply- and waste-pipes laid with proper fall, and securely protected against frost or other injury.

PAINTING AND GLAZING.

All exposed wood- and metal-work will be painted.

Paint all wood-work three coats common colors in oil, as hereafter directed, inside the building. All outside wood-work four coats in oil. Inside galvanized iron three coats, and outside, four coats.

All cast-iron, three coats common colors in oil. Roofs to have one finishing coat after they are left by tinsmiths, and one coat of metallic paint for covered parts of frames.

On all galvanized iron-work, inside and out, the first coat will be of red lead.

On cast-iron the first coat will be given by founder, but must be carefully retouched by painter where required.

Finishing coat of roofs to be pure oxide of iron. All hard woods will be finished in oil in the best manner, and afterwards polished.

Use only pure white lead throughout of approved brands. No zinc; best pure linseed oil.

The glass will be as follows:

For the lights from first floor to basement supply $\frac{3}{8}''$ rough rolled plate, in putty well bedded. All other glass in basement to be best American glass, double thickness.

All windows and transom-lights on first floor to be best polished plate, $\frac{3}{16}''$ thick.

Glass panels in water-closet doors to be glazed with ground American glass, double thickness. Transom lights bright.

Roof Lights.—$\frac{3}{8}''$ half white rough plate. Plate glass to be put in with beads—all other glass well puttied. Roof lights laid with especial care to keep out water and provide clearance for condensed water.

Use the best beat plate in dome; rolled plate in suspended ceilings.

Generally.—The last coat of all work must not be put on before winter 1875 to 1876; any defects on previous coat to be carefully repaired before finishing. All painting and glazing must be delivered sound and clean.

The scaffolding for outside will be furnished by carpenter. Inside, the plasterer's scaffold will remain for painter for a sufficient period for him to finish with all due diligence and dispatch.

LIGHTNING-RODS.

Provide and erect as directed. No. 7 lightning-rods to be of 24 strand, No. 17 copper wire, each line being taken down separately on the inside of Building.

Carry same under floor of basement, not less than 2 feet deep—and connect with water-pipes.

On roofs, the rods to be taken up not less than 10 feet above ridges, through galvanized tubing of proper size, well braced and secured on roofs, and terminated by a cluster of seven points on each.

GAS-FITTING.

N. B.—This department is to be supplied as directed hereafter.

HEATING APPARATUS.

State a prime cost for heating apparatus complete, and submit proposals for the best patents or methods known.